The CRUSHED STONE JOURNAL

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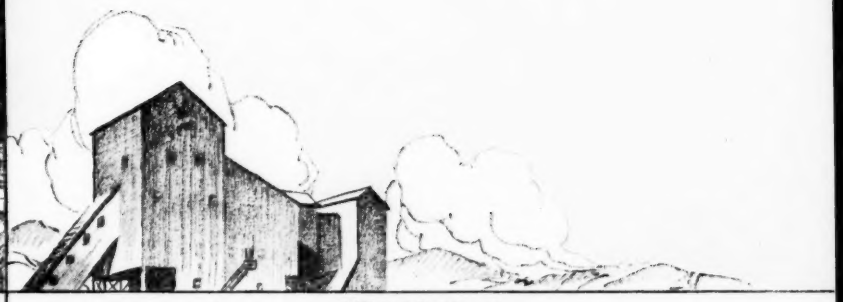
Crushed and Broken Stone in 1938



May-June · 1939

Official Publication
NATIONAL CRUSHED STONE ASSOCIATION

Technical Publications

of the

National Crushed Stone Association, Inc.

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The Bulking of Sand and Its Effect on Concrete

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The Crushed Stone Journal

Official Publication of the NATIONAL CRUSHED STONE ASSOCIATION

J. R. BOYD, Editor

NATIONAL CRUSHED STONE ASSOCIATION

1735 14th St., N. W.
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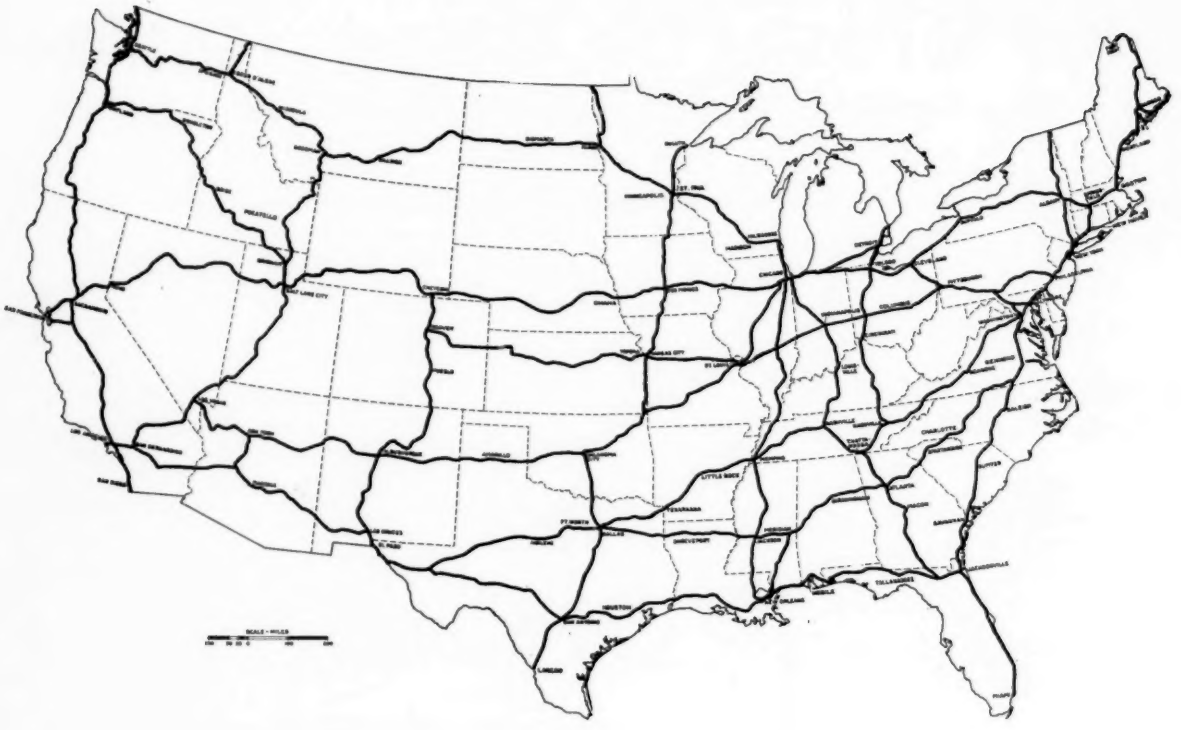

Location of Existing Routes Tentatively Selected as Approximating the Lines of a Proposed Inter-Regional Highway System

THE CRUSHED STONE JOURNAL

WASHINGTON, D. C.

Vol. XIV No. 3 MAY-JUNE, 1939

Toll Roads and Free Roads[1]

AN ANALYSIS OF THE REPORT OF THE BUREAU OF PUBLIC ROADS PREPARED BY THE NATIONAL HIGHWAY USERS CONFERENCE

CONGRESS, under the Federal Highway Act of 1938, directed the Bureau of Public Roads to investigate the feasibility and cost of building a system of transcontinental superhighways to be supported by tolls—such a system to be composed of not to exceed three roads east and west and three north and south.

The Report in its final form was transmitted to Congress by a special message from the President on April 27, 1939.

"I recommend the report for the consideration of the Congress as a basis for needed action to solve our highway problems.

With this closing sentence, the President placed his stamp of approval upon findings and recommendations of the Bureau.

The following language appears elsewhere in his message:

"It shows that there is need for superhighways, but makes it clear that this need exists only where there is congestion on the existing roads and mainly in metropolitan areas."

Transcontinental superhighways cannot be supported by tolls.

There is no habit of transcontinental travel by highway.

Less than 4 per cent of all trips outside of cities are longer than 50 miles.

Only a small portion of present traffic could be attracted to a toll system.

Motor vehicle traffic in 1960 will be virtually double that of today in miles traveled.

There should be a system of direct interregional highways with necessary connections through and around cities.

By-passes will not relieve congestion within and near cities.

Ninety per cent of the traffic on main highways near cities is bound to or from the cities themselves.

Express highways cutting directly into and through the center of big cities are needed.

An independent Federal Land Authority should be created, empowered to acquire lands needed for public purposes. It should be implemented to acquire, by purchase or condemnation, necessary lands for adequate urban and rural rights-of-way at reasonable costs, the same to be sold or leased to the state or municipality on an amortized basis. It should also be empowered to acquire and sell excess lands for the purpose of recoupment.

Such "excess taking" would require changes in Federal and state laws.

The Report is properly divided into two main parts, each replete with tables, maps and plates setting forth statistical information. The Bureau has drawn extensively from the traffic counts and other basic data developed during the past two years by the Statewide Highway Planning Surveys now being conducted in forty-six states.

PART I

THE FEASIBILITY OF A SYSTEM OF TRANSCONTINENTAL TOLL ROADS

Important Conclusions

The Report asserts that *a system of transcontinental superhighways cannot be supported by tolls;* that the factual evidence clearly indicates that "direct *toll high-*

[1] Reprinted through the courtesy of the National Highway Users Conference, National Press Bldg., Washington, D. C.

ways cannot be relied upon as a sound solution of the problem of providing adequate facilities for the vital and necessary transportation of the United States or to solve any considerable part of this problem."

From a purely engineering standpoint, the Report shows that such a system might be entirely feasible, physically, and the construction could be completed by 1945 with a capacity sufficient to handle the traffic that would be developed by then and for the period 1945-1960.

A super toll highway must be so constructed as to offer a special attraction to traffic. It must have an adequate number of lanes to comfortably take care of the peak load. It must offer advantages that loom larger than the tolls charged, and *the width or number of lanes must depend upon the maximum rather than upon the average use.*

The Report finds that 400 vehicles per hour, divided equally in both directions, is a maximum which may safely be carried over a 2-lane road without inconvenience. It has been found that a peak load of 400 cars per hour for certain hours will approximate a total of 1500 vehicles per day, on the same road. It also finds that *3-lane pavements* are undesirable; they show no marked increase in the volume of traffic than that which can move comfortably over a 2-lane road.

Traffic exceeding 1500 vehicles per day should be carried on divided 4-lane highways.

The year 1960 has been selected as being far enough in the future to permit of careful long-time planning. Furthermore, *it is estimated that by that year the motor vehicle traffic mileage will be double that of today.*

Estimated Cost

Pursuant to the directions of the statute and after a thorough analysis of the wealth of basic data concerning volume, character and range of traffic, the condition of existing highways, and the need for new facilities, the Bureau selected approximate locations for six superhighways, the total length of which as projected would be 14,336 miles. The estimated cost of constructing them to desirable standards would be $2,899,800,000 or an average of $202,270 per mile.

The Report answers any possible suggestion that proposed toll rates might be increased to provide the required revenue. It emphasizes the fact that the average motorist has an income of only $1500 per year. It also points out that even a superhighway toll charge of 1¢ per mile would actually double the cost of operating a small automobile. The more money people spend for tolls, the less they have left to spend for operation of their vehicles.

Toll rates that would probably produce the most favorable rate for the system as a whole would average 1¢ per mile for each passenger car and 3.5¢ per mile for each motor bus or truck, the latter rate varying considerably with the weight and capacity of the vehicles. It is assumed that bus and truck traffic constitute 20 per cent of the total traffic; an approximate average weight would be 1½¢ per mile for each vehicle, regardless of type.

Potential Toll-Paying Traffic

The total utilization of these six super roads in their entirety would not be expected to exceed 4,544 million vehicle-miles of toll-paying traffic per year. The study indicates that 3,635 million vehicle-miles would be by passenger automobiles and 909 million by motor trucks and buses. This averages 12,450,000 vehicle-miles per day, or an average of 699 passenger vehicles and 175 motor trucks and buses on each mile of superhighway per day.

"The most optimistic estimated average daily toll-paying traffic for the period varies from a maximum of 5,998 passenger automobiles and 1,500 motor trucks and buses for the section from Jersey City, N. J. to New Haven, Conn., to a minimum of 96 passenger automobiles and 24 motor trucks and buses for the section from Spokane, Washington, to Fargo, North Dakota."

The cost of construction, maintenance and operation of these six turnpikes between the years 1945 and 1960 would average $184,054,000 per year. On toll rates of 1¢ per mile per passenger car and 3.5¢ per mile per bus or truck, the revenue for that period would only be $72,140,000 per year. *"It is therefore concluded that a direct toll system on these six superhighways in their entirety would not be feasible as a means of recovering the entire cost of the facilities."*

Only a small portion of present traffic could be attracted to a toll system. Long distance travel constitutes only a small fraction of the total. The majority of trips outside of cities is for less than 10 miles, and *less than 4 per cent of all such trips are longer than 50 miles.* Only 300 passenger vehicles cross a given line daily in transcontinental travel. *There is no habit of transcontinental travel by highway.*

Vast portions of rural and interurban travel would never reach the nearest superhighway and could

Photo by U. S. Bureau of Public Roads.

SKETCH SHOWING THE GENERAL FEATURES OF A DESIRABLE DESIGN FOR A DEPRESSED EXPRESS HIGHWAY IN A CITY.

Photo by U. S. Bureau of Public Roads.

SKETCH OF SUGGESTED INTERSECTION OF U. S. 1 AND A POSSIBLE BELT LINE AROUND BALTIMORE.

not be considered as even potential traffic for the system. Vehicles traveling shorter distances than the spacing between access points would not use the toll roads.

A major share of the longer range traffic could not be counted upon when adequate free highways approximately parallel the toll roads. *The bulk of traffic would continue to use the main public highways.* The remainder of potential patrons who are able and willing to pay the toll "in practically all cases is too small to support the cost of the desired facility except at a rate exceeding the willingness or ability of even these."

Heavy Traffic Sections

The portion of the proposed system estimated to be most nearly self-supporting is the 172 miles from a point near Philadelphia to a point near New Haven. With the increase in traffic expected by 1960, this portion alone would earn slightly more than its estimated cost for that year. Twenty-five other sections are analyzed upon which the anticipated revenues for 1960 would produce from 91.8 per cent down to 50.5 per cent of the estimated cost for that year. *Thus it will be seen that only 4,000 miles of the entire 14,000 miles would come within 50 per cent of paying its way.*

The Report suggests that if Congress desires to make a test, a section of highway properly located between Washington and Boston would offer the best possibilities of attracting traffic in sufficient volume to approach financing through the toll method.

PART II

A MASTER PLAN FOR FREE HIGHWAY DEVELOPMENT

Component Parts of the Plan

The Bureau, in addition to making a study of a suggested super toll highway system, supplemented its Report with a proposed *Master Plan for Free Highway Development* throughout the nation. This calls for appropriate action by Federal, state and local governments. As desirable joint contributions of the Federal and state governments, the Report lists the following undertakings:

1. The construction of a special, tentatively defined *system of direct interregional highways,* with all necessary connections through and around cities, designed to meet the requirements of the national *defense* in time of war and the needs of a *growing peace-time traffic* of longer range.

2. The modernization of the Federal aid highway system.

3. The elimination of hazards at railroad grade crossings.

4. An improvement of secondary and feeder roads, properly integrated with land-use programs.

5. *The creation of a Federal Land Authority* empowered to acquire, hold, sell and lease lands needed for public purposes *and to acquire and sell excess lands* for the purpose of recoupment.

In addition to these enumerated undertakings, the Bureau concludes that:

The Federal government should recognize this national problem by advancing the funds essential to the purchase of lands necessary to this capital investment.

These lands should be leased to the states and their subdivisions for a period of years on a basis which will result in amortization of the cost.

Construction of a special system of direct interregional highways, as referred to in numbered paragraph 1 above, would tentatively include 26,700 miles of roadway. *Existing main highways can be modernized to form a large part of that system,* but some new highways will be needed to provide directness of travel. Although these roads represent less than 1 per cent of the total mileage of rural roads, the Bureau estimates that they would serve, when improved as indicated, at least 12.5 per cent of the total rural vehicle mileage.

Transcity Connections and Express Highways

One of the striking characteristics common to all highway traffic maps is a sharp enlargement of the bands representing the volume of traffic on the important highways as they approach the larger cities. Obviously, these enlargements have a local cause. In fact, they are caused by a multiplicity of short movements into and out of the city; and it is not uncommon to find that the traffic on a main route approaching the city is swelled to several times its volume a few miles from the city limits.

Ninety per cent of the traffic on main highways near the entrance to large cities is bound to or from points in the cities themselves and cannot be bypassed around them. A large part of that traffic is destined to or bound from points in the very heart of the city or points conveniently reached by going through the center of the city. *Express highways cutting directly into and through the center of big cities are greatly needed,* not only for through traffic, but also for daily "in-and-out" movement of local

traffic between downtown sections and suburbs. This can best be handled on overhead or "depressed" highways, preferably the latter.

By-passes may not be regarded as means for the relief of congestion of this kind. Even if the entire through traffic on the main highway could be diverted over a by-pass route, the volume of traffic on connecting streets at the center of the city would not be reduced by any appreciable proportion. *Only a small per cent of the existing traffic at the city's entrance can be diverted.* The bulk of the traffic that is bound to or from the center of the city can best be served by transcity connecting routes and express highways. By-passes are recommended for the smaller towns, while *a new type of belt-line distribution road around cities is proposed.*

Using the City of Baltimore as an example, it was found that the great problem is to provide relief for the in-and-out movement of local generation. For instance, there are over 9,000 cars per day traveling between Washington and Baltimore but only 1,068 of these cars travel between points beyond Washington and points beyond Baltimore.

The Report deals with the subject of slow decay in those parts of the city that are adversely affected by existing traffic conditions. Greater space is needed for the unfettered circulation of traffic. Plans must be made to remove the impediments that embarrass the movement of 20th Century traffic through 18th Century streets.

"Excess Taking"

The most spectacular addition to the accepted highway methods of the past three decades is the proposal to empower Federal and state governments to embark upon a large program of purchase and condemnation of wide strips of land in both rural and urban areas.

The Report points out that the early obsolescence of rural highways previously built is due in a large degree to restrictions imposed upon their design by inadequate rights-of-way. Major revision is also needed in the present archaic street plans in order to permit the free flow of modern traffic. Farsighted improvements of both are blocked everywhere by the inability of the states and local governments, unaided, to provide required rights-of-way. There is danger that "expedient measures forced by the irresistible pressure of traffic will result in heavy new investment destined for early obsolescence." Needed new facilities will involve a heavy present investment but it should prove to be a permanent one and should pay large dividends in the avoidance of future expenditures.

A Legislative Problem

Many state and local highway authorities operate under definite statutory restrictions as to the maximum width of right-of way that may be acquired. These statutory widths often were adopted many years ago, and it is difficult for the authorities to acquire rights-of-way in excess thereof, regardless of what traffic conditions to be met may require. The U. S. Supreme Court has indicated that *the use to which the land is to be made is subject to definite limitations in order to avoid infringement of rights guaranteed by the Constitution.* Consequently, legislative changes must be made, both state and Federal. The Ohio Supreme Court has said: "We cannot sanction an arbitrary and unreasonable taking of excess private property."

The Report recommends that the statutes of each state be carefully examined and revised where necessary; that such revisions should eliminate maximum widths which may be acquired, and if any specific limit is prescribed, it should be the minimum not the maximum; that discretionary powers should be conferred upon highway authorities to determine the width desired with specific authority for such right-of-way to include lands in excess of those actually needed for the physical location of the facility so as to provide for safety, roadside development, recreational, sanitary and other facilities, and for future expansion of the transportation facility to meet prospective future needs.

"When we consider that the highway widths provided for in existing statutes were adequate for all practical purposes less than twenty-five years ago, it is not difficult to understand why we now find the right-of-way problem one of the most difficult with which we have to deal."

Federal Financing

By supplying capital for investment in adequate rights-of-way on a scale sufficient to protect the facilities and provide amply for their expected growth, the Federal government can lend practical aid.

"Such rights-of-way acquired with Federal funds at the request of a state highway department and in accordance with state and Federal laws, could remain the property of the Federal government subject to lease by the state over a period of 50 years

on terms that would in that period amortize the initial cost."

"In view of the predominant national importance of such a system, the Federal government could reasonably contribute to its construction in a proportion materially larger than that in which it contributes under the Federal Aid Act."

The creation by Congress of a Federal Land Authority is recommended. It should have a corporate status with authority to issue obligations and power to acquire, hold, sell and lease lands for stated purposes (such as adequate width for future rights-of-way, safety factors, roadside development, recreational areas, sanitary provisions, removal of unsightly obstructions, etc.).

Such an authority would also be an effective means for promoting reasonable coordination with other Federal agencies that must purchase land for their own use, such as public buildings, parks, slum clearances, etc. *The proposed aid of the Federal government could not be effectively employed in any state in the absence of constitutional authority.*

Extent of Acquisitions

"Acquisitions by such agency should include all areas, the need for which might reasonably be anticipated for the physical construction of the improvement and for necessary roadside development, including probable future expansions." Authority should also be given to solve the "remnant problem," i. e., small parcels that are separated by the road improvement from the main body of land to which they were originally attached and the value of which is impaired to the owner by the separation. It is far cheaper to buy such lands outright in many cases than to pay the actual or proven damages.

Detailed investigations should be made leading to the designation of a system of reasonably direct interregional highways with appropriate connections through and around cities and limited in total extent to not more than 1 per cent of the total mileage of the rural highways in the United States.

The Report of the Bureau includes in its appendices a copy of the "Restriction of Ribbon Development Act, 1935" of Great Britain. This provides for the acquisition of any land within 220 yards from the middle of any road, which is declared necessary for purposes of construction or improvement or for the preventing of the erection of buildings detrimental to the view. This provides a strip 1320 feet in width.

Other Recommendations

The Master Plan, according to the Report, is a 20-year program, and *any delay at this time means increased congestion by 1960.* Outside of city limits, there is need of modernizing the main highways to ease curvature, reduce grades and extend sight distance. Near the cities, there must be a steadily increasing mileage of 4-lane divided highways.

Such improvements are required on most of the Federal aid and state highway systems, especially those parts built before the comparatively recent increase in travel speed of motor vehicles. For the most part, the Report shows these improvements involved only local changes in existing roads.

The suggested *improvement of secondary and feeder roads* would include a careful selection of mileage from among the 2,650,000 miles of roads outside of the state and Federal aid systems. This 78 per cent of the country's total road and street mileage at present serves only about 10 per cent of the total vehicle mileage of traffic; but located on them, are the homes and working places of about 75 per cent of the rural population. The choice of these secondary roads to be improved is important, therefore, in the promotion of beneficial land use. The states should select not to exceed 10 per cent of the rural mileage for such improvement. These thoughts are incorporated in the following recommendations:

By continuance of cooperation with the states in the *improvement of the Federal aid highway system* and the elimination of hazards at railroad grade crossings, with annual authorizations commensurate with those previously provided.

By *continuance of the program of secondary and feeder road construction,* with appropriations equal to, or larger than those authorized for the fiscal years 1940 and 1941, to be expended in such a way as to give effect to the principles enunciated in this report.

COMMENTS

There can be no doubt that the proposal of "excess taking" is the crux of the Master Plan. It should be noted that *the President's message* strongly emphasized the principle as a means of preventing excessive purchase and condemnation payments, and of self-financing through the resale and rental of excess parcels along the right-of-way. In fact, the President would apparently carry out the idea much farther than the Report seems to recommend.

The Executive message reads in part:

"Under the exercise of the principle of 'excess taking' of land, the government, which puts up the cost of the highway, buys a wide strip on each side of the highway itself, uses it for the rental of concessions, and sells it off over a period of years to home builders and others who wish to live near a main artery of travel. Thus, the government gets the unearned increment and reimburses itself in large part for the building of the road"—rather than providing a proft "to a mere handful of lucky citizens and which is denied to the vast majority."

This theory of *"excess taking" and recoupment* was espoused by the President a year ago when he made his first pronouncement in discussing a super toll highway system.

The Report sets forth the fact that "attempted takings by condemnation in excess of that actually necessary for the physical location and construction of definitely contemplated improvements have been held unconstitutional by the courts." With that fact in mind, the question naturally arises as to whether the situation can be remedied through new legislation, either Federal or state. It may require constitutional amendments in many jurisdictions, and that is something that cannot be hurried.

Possible Legislation

It is understood that bills are being drafted for the creation of an independent agency to be called the Federal Land Authority, composed (probably) of the Secretary of Agriculture, Secretary of War and the Administrator of U. S. Housing Authority; the Chief of the Bureau of Public Roads as Executive Director. This Authority would have corporate powers with a capital stock of $100,000,000 pledging the full credit of the United States. It would be empowered to issue bonds and securities not exceeding $500,000,000 outstanding at any one time.

Such bills will, no doubt, include the right of eminent domain and of condemnation for the purchase of lands to be used for highways, and the power to purchase adjacent lands. Purchase or condemnation will probably require prior approval of the State Highway Departments and the Bureau of Public Roads. The Authority will doubtless be authorized to sell lands adjacent to condemned or purchased rights-of-way, and to enter into contracts with municipalities before condemnation or purchase of urban extensions; the municipality to repay the Authority the purchase price, plus interest, over a period of 40 years. It is understood that at least one such bill would clothe the Authority with power to collect tolls.

The idea of "taking" lands in excess of those absolutely necessary for use in developing the facility will have to be worked out with the greatest care. The political implications must be thoroughly analyzed in order that they may be avoided. It will not be sufficient, in the minds of many, to authorize broad powers of condemnation simply for the purpose of transferring the profits of the unearned increment from the individual property owner to the government.

New Landmarks

In "excess takings," including excess condemnations, a new term has been added to the highway lexicon. It is a term that denotes a new idea in highway technique, *one that deserves careful and intensive study.*

The Report indicates a definite alteration in engineering thought relative to by-passing cities. *By-passes* have been urged and recommended by engineers for two decades, to permit through travel to avoid downtown traffic. Now it is the local traffic, to and from the downtown area, itself, that must be relieved. The data developed by the State-wide Highway Planning Surveys are responsible to a large degree for this changed thinking.

Roads, once thought of as being rural, are coming to possess more and more urban characteristics. *City streets* instead of being considered incidentally as urban extensions of main rural highways, are now advanced to a more dominant position in the road program.

Among other questions raised with reference to the Report, and its recommendations, are the following.

Are there adequate grounds for the assumption that highway traffic will be doubled by 1960? There are those who predict a lessening of highway travel due to improved home conditions, such as air-conditioning, television, etc. Any appreciable increase in cost of travel would also act as a deterrent.

A question is raised as to the amount of existing highway mileage that will be suitable for incorporation into the 20-year interregional highway plan. This is particularly questioned with reference to radial, belt-lines, by-passes, overheads and depressed highways.

The Report contains no estimation of probable costs of the recommended Master Plan. There is, of course, the assumption that a major portion of land

acquisition costs to be borne by the Federal government may be recouped through the sale of excess parcels, the government profiting by the unearned increment. The fact remains, however, that there will have to be vast sums appropriated by the Federal government to the proposed Federal Land Authority and that the Federal government's immediate share will probably reach 75 per cent of the initial total cost. There is apprehension on the part of some that this might result in increased Federal gasoline taxes. H. R. 6228, recently introduced by Representative Keller of Ill., proposes an additional ½¢ gas tax plus a Federal registration fee of $3 on passenger cars and $10 on trucks.

A Contribution of Great Value

Practically all observers believe that the Master Plan seeks to solve the future problems of highway construction with a forthright and constructive program. There is no gainsaying the fact that the problem is of vital interest to the entire nation. Engineering News-Record of May 11 notes it as being "one of the most important guide documents of public policy in developing modern road transport since the Federal-aid laws of 1921." Further commenting on the Report, the News-Record says, "Its great contribution is bringing measured fact to bear on the problem and relegating to well-deserved limbo the fantastic schemes for transcontinental superhighway grids that often find voice in Congress."

The Report has been prepared by the most expert minds now dealing with the problem. Common business judgment demands that it receive most careful and serious consideration by automobile owners, truck and bus operators, business representatives and legislators, both state and Federal.

There is an annual diversion of special motor taxes to other than highway purposes that is in itself sufficient to finance this plan almost in its entirety. *If the program is to be adopted, the anti-diversion campaign should become an integral part of the whole idea.*

The full text of the Bureau of Public Roads Report, together with all maps, plates, etc., is now available in printed form, and single copies may be obtained from the U. S. Bureau of Public Roads, Washington, D. C., without charge.

Children and Blasting Caps

RENEWED efforts are now being made in all parts of the country to lessen the number of accidents occasioned by children playing with blasting caps.

These accidents often result in children being blinded, or losing fingers or hands, and thus going through life in a crippled condition. In some cases children are killed.

Most of these accidents occur in country districts where children find the caps in the neighborhood of blasting operations, where, in many cases, they have been left by careless workmen. Playing with these caps—such as picking them with nails, hitting them with hammers, or throwing them into bonfires, usually results in an accident.

Blasting caps are small copper cylinders used to detonate explosives in mines, quarries, construction work, and in blasting ditches, stumps and boulders. They are closed at one end and loaded with a sensitive and powerful explosive. Electric blasting caps are similar to the regular caps except that they have wires attached and are detonated by an electric current from a blasting machine.

When the cap explodes small particles of copper fly in all directions. Any child nearby may be hurt.

Children should be warned not to play with these blasting caps, but when they do find one, to notify an officer of the law or other responsible adult.

Motor Vehicle Registrations Show Slight Drop for 1938

MOTOR vehicle registrations in 1938 totaled 29,485,680, a decrease of .7 per cent below the 1937 figure, according to reports of State agencies to the Bureau of Public Roads, United States Department of Agriculture. Registrations consisted of 25,261,649 passenger vehicles and 4,224,031 trucks. These figures do not include 109,761 Federally owned vehicles and 257,469 vehicles operated by States, counties, etc. One-third of the States reported small increases in registration, while two-thirds reported slight decreases.

Total registration fees for all vehicles amounted to $340,061,000. Miscellaneous receipts such as fees for permits and certificates of title, fines, and penalties brought total receipts to $388,825,000.

Present Trends and the Capital Goods Industries[1]

By WILLARD T. CHEVALIER
Publisher, Business Week; Vice President, McGraw Hill Publishing Company

• **In the following discussion Colonel Chevalier takes issue with the public conception that consumable goods are used up whereas capital goods are not. To this possible fallacy in economic thinking he attributes many of the present day difficulties in the capital goods industries. Crushed stone producers should find his observations intensely interesting.**

FIRST of all, I should like to tell you how good it is to visit with the Crushed Stone Industry once again. I came to know you pretty well back yonder in the days of the NRA, when we fought and bled together in Washington, day and night (mostly night, it seems to me), and out of it all came a code which now has gone "where the woodbine twineth."

But I sometimes feel that the biggest thing that came out of that experience was not the code, was not that collection of clauses written on paper. It was the opportunity, indeed, the compulsion of working together. I haven't the slightest doubt that the work you have done in behalf of your industry since 1934 has been the better, the more wisely and the more effectively done for the experience that you had in trying to write a code in that year.

I have always felt a very real pride as well as pleasure in the part that it was given me to take in that effort. I congratulate you on the Association that you have today, and on the progress that you have made since we were associated.

The subject assigned to me this morning, as you will see, is outside the realm of your own immediate interest. And I think it is well that it is outside, because you surely have heard yesterday and today, and will continue to hear, much concerning the detailed practice of your own industry, that will be far more useful and practical than anything I could bring to you. A long while ago I learned that it is a great mistake for any outsider to talk about the detailed practice of any business to experts in that business. He can't contribute very much that will be of practical value, and he is very likely simply to betray his own ignorance. With respect to the Crushed Stone Industry, therefore, I shall follow the old proverb which says that it is better to keep your mouth shut and be thought ignorant than to open it and remove all doubt.

However, perhaps there are a few practical aspects to what I should like to leave with you. You know as well as I do that all business and industry is engaged in doing one of two things. Either it is producing and distributing the commodities and the services that people are using up from day to day in the business of living—we call that type "consumer goods" industries because its product is quickly consumed and used up and must be replaced by a new supply; and then we have another type of business and industry that is devoted to providing the long-term facilities of industry, of business, of commerce, and of community life. Right here I should like to peg a fallacy that has confused much of our thinking with respect to those industries, one that I shall refer back to in just a few moments.

There has been a feeling that whereas consumable goods are used up, capital goods are not. But the fact is that they, too, are used up. The difference is merely one of degree. Capital goods are used up more slowly; so we have come to look upon them as having a sort of permanence. That fallacy has profoundly affected our attitude toward finance in this country of ours. Let me just peg that right there, because I want to come back to it in discussing the trends that affect the capital goods industries. Nevertheless, there is this difference in the rate at which capital goods are consumed as compared to the rate at which consumable goods are consumed.

These capital goods, as we call them, consist of what? Factories, railroads, office buildings, homes, highways, flood prevention, water supply, sewerage plants, mills—and so I could go on. But you know what they are as well as I do. A very large part of your business is found in the provision of those facilities. Therefore, your business is intimately

[1] Presented before the 22nd Annual Convention of the National Crushed Stone Association, January 31, 1939, Cincinnati, Ohio.

tied up with the welfare of the capital goods industries. When there is no investment of capital in such facilities you have no business; or at least you have a very little business. When there is a great deal of that sort of thing going on you have good business.

Therefore, it seems to me to be worthwhile for an industry such as this to stop now and then and take a look at the trends that are going to affect the well-being of these industries, not just today or next month, or even next year, but over the long term.

When we come to this job of providing the facilities that are required by business and industry, by commerce and the community, we are at once confronted by another division into two kinds of business. On the one hand, we may be providing facilities for increased production and service, for expansion of our productive and service facilities as a whole. On the other, we may be providing such facilities to replace those that have either worn out in service or become obsolete because of the progress of the art that they serve.

Right there is found the first grave question that confronts us in trying to appraise the future of the capital goods industries, and therefore of your business. For there are those abroad in the land who feel that we are facing a protracted period of no further expansion of our national facilities. I know I am exaggerating to make a point, but substantially there is a school of thought that teaches that our country has reached its physical frontiers, that our period of great geographical expansion in terms of new service and productive facilities of one kind or another is over. From now on, they say, it will be a hand-to-mouth existence, with more and more emphasis on the traffic in consumable goods and services.

If that is true, we must give it considerable thought. Because if it is true, we shall have to look more and more toward the replacement market to find a market for your goods. If that is true the capital goods industries gradually will shrink more and more to a mere matter of replacement due to wear-out, deterioration and obsolescence. And if for the moment we assume that to be true, we must turn our eyes in behalf of the capital goods industries, as never before, to the research laboratories of industry, of our institutions of learning, and wherever we may find them. For out of the research laboratories will come the technology that will obsolete the facilities that we have today and make necessary the provisions of new ones for tomorrow.

You heard Mr. Keefe tell you something of the outlook for automotive transportation; the possibility of 50,000,000 cars, costing half what they cost now. Necessitating what? Necessitating the obsolescence of thousands of miles of our highways that may now be perfectely good to meet the requirements of present technology in automotive transportation. But out of the laboratories of the great motor companies, and out of many other laboratories connected with institutions of learning and research, will come those facilities and those new discoveries, the new materials and the new sources of power that will make possible these cars that can be produced and sold for so much less than the present car. It is just that which will continue at an increasing rate, and which will make necessary the obsolescence of our highway system.

That is why I say that if for the moment we assume the worst to be true, if the capital goods industries are to be confined in the future to a replacement market, you have a very great concern in the work that is being done in technology and research. For out of that effort will come the forces that will produce the obsolescence to which you must look for a market for your goods and services. I cannot imagine any group, whose business welfare depends upon the prosperity and the well-being of the capital goods industries, who should not be greatly concerned and interested in what is going forward in technical research and technology. For that will be the motive power of his prosperity.

Let us, however, turn back to this matter that I laid on the shelf for a moment. Is it necessarily true that there will be no more "expansion market" for the products of the capital goods industries? What must be done if, despite the fact of the limits upon our geographical frontiers and our natural resources, we would maintain a period of industrial expansion? Only the other day in this city I was talking to the head of a large manufacturing company. I expressed myself somewhat as I did just a moment ago as to the future of the capital goods industries, and he said, "You are quite wrong. I believe that we are entering a period when we must have an expansion of facilities in this country."

I said, "How do you figure that out? The rate of population increase is declining, our natural resources have been pretty well developed and preempted"—not consumed to be sure; we have great wealth still locked up in our natural resources, but nevertheless they have been preempted; "many of them not only have a deed attached to them but

also a mortgage of considerable proportions." I said, "How do you think that we are going to continue to have a period of great expansion if we have a declining rate of increase in population and if we have our natural resources pretty well preempted, and if today our great problem is to find consumption for our present productive capacity?"

He said, "That is exactly the point." And may I say to you in explanation that this gentleman is a conservative, practical manufacturer, in no sense a theorist. He continued: "We must realize that we are moving into a pay-roll economy. We have passed out of the period when every man started out in life with the idea that some day he was going to have his own business and be a proprietor. That road is not going to be open to so many people. We cannot have the kind of civilization that we have now and continue to develop it with the same concept socially and economically that we have had up to date, and we are passing into a pay-roll economy where more and more people will be on a pay-roll rather than independent proprietors. And that means," he said, "that business and industry must add a new responsibility to those they now have. That responsibility is to see that every able-bodied person has a chance to earn a living under the system that we have."

I remembered as he said that, a conversation that I had had with another industrialist about ten days before in which he said this: "Up until now our business and industry has contemplated just one job. That job has many facets but after all, it is the one job of producing and distributing goods and services. Business and industry have been proud of the manner in which they have fulfilled that obligation. But we have forgotten that our business system has another obligation as vital as that one, just as essential as that one. It is to see that in the production of the goods and services needed by the people, all people get a chance to exchange their services one with the other."

He emphasized that we were living in an economy of high specialization—which is exactly the same thing my Cincinnati friend meant by a pay-roll economy—where each of us must necessarily become a specialist in some function of business or industry or technology, in some craft or trade or profession; where each of us today, so great is the expanse of human knowledge, must specialize on some little part of it. And if we are to live, we must be able to convert our specialized knowledge and experience into the bread and the cheese that we need to keep body and soul together. So we must find someone with whom to change what we are able to produce in return for what they are able to produce. In other words, unless we maintain a constant exchange of services we cannot support an industrial and pay-roll economy. So it becomes, according to my friend of ten days ago, a very heavy obligation upon business and industry as a whole, not only to produce and distribute what we need, but also to see that in the process of doing that there is a place for everyone so that everyone may have a chance to trade what he produces in return for what he needs.

This, of course, is not a new or radical thought. This is not a *new* obligation of business and industry. It always has been an obligation of business and industry, but we have taken it for granted. Under the economy that we have operated on for 100 years, and under the conditions that have obtained in this country, it has, generally speaking, automatically taken care of itself. So as business and industry concentrated on the technical and administrative side of its job of producing things and distributing them, somehow or other the bulk of the people managed to find places in the economy whereby they could exchange their services. But now, it is becoming necessary for us to approach that as a somewhat more conscious responsibility than we ever considered it before.

Considered in this fashion—as a more conscious handling of an old familiar job—our present problem seems a lot less formidable than when we contemplate the choice that is offered to us by propagandists of various hues. We have people telling us, on the one hand, if we are to solve this problem we must embrace communism; and on the other hand, we have those who say, "Oh, no, you don't want that, so in order to escape that we must embrace fascism."

I say, to h— with that choice!

To those who urge that we must choose between communism and fascism I reply that there is another choice. And if there is anything that I resent today (and I try to be rather dispassionate concerning matters economic), it is the efforts of the propagandists who are trying to herd the American people into one or the other of those two corrals. We have some otherwise sensible people today who think that the only way to fight communism is to go for fascism, and on the other hand we have those who so fear fascism that they are ready to embrace communism.

What a silly picture it is, that the Americans, the people who have here conditions, and the making of conditions, that cannot be matched in the world and never has been matched in the world, should want to get themselves in the same slough that has swallowed up so many of the people in the rest of the world.

Why not take what we have and go to the roots of its difficulties, find out its evils and correct them, rather than try to swallow a choice between what has been contrived to meet conditions elsewhere. At this point we are better off than any of them. Why even consider cancelling out our advantage now and aping those who, in their extremity, have turned to this, that or the other desperate recourse? I am not judging them, I am not saying they shouldn't have done what they did. I am not saying they should or could have what we have here. In their extremity they seized this remedy or that remedy, or had it imposed upon them, and only the good God knows how any of them will turn out before they are through. All those much-touted "isms" are still great experiments. They still represent nations of people in a desperate struggle for existence. But why in the name of common sense, should we want to imitate them when we don't have to. And if it should come to pass that we do, I believe that we shall stand indicted as the most stupid race of men that ever walked the face of the earth.

Having what we have and living what we have lived, with our experience and our people and our manhood and our viewpoint, if we can't do better with what we have than those poor people over there have been forced into doing with what they have not, then it will be just an indictment of ourselves, beyond anything that tongue or pen could draw.

If we assume that we want to do the best with what we have, and that we want to make the best of our advantage, I say that we must look straight into this question that is on the program for me today: What about the capital goods industries? Because it is in our handling of that problem that we shall find the answer to how we can make our economy serve us better and evade the choice of Europe.

One of the first considerations that we must face, it seems to me, is that of insuring a necessary expansion of our productive facilities. And how are we going to do that? We can do that very definitely by making it possible for more and more of our people to enjoy a higher standard of living. It sounds familiar, doesn't it? Well, don't jump too far from that springboard after a conclusion; because I don't think it is necessary to do a lot of the things that have been recommended to that end in the name of progress and idealism. The greatest danger to a democracy is a leadership of high ideals and no scruples. And so to set up an ideal doesn't necessarily mean approval of the practices of all who profess the same ideal.

It is not going to solve our problem merely to hand more of our people the cash whereby to enjoy a higher standard of living. It makes a vast difference where that cash comes from. It makes a difference whether it is administered in a fashion that will increase our production of the things necessary to higher living standards or decrease it. It makes a difference whether we contrive to *create* more and distribute it more widely or whether we simply destroy our productive power in an effort to *take* from some and *give* to others. The manner of doing is distinctly a factor, fully as vital as the objective we seek.

However, the opportunity is there. It was shown in the Brookings Institution survey a few years ago that the number of families in this country that are living on an income of less than $2500 a year constituted, as I recall it, some 70 per cent of the population. It was shown that if all the families with incomes lower than $2500 could be raised to $2500 a year (without at all raising the income of the families in the higher brackets,) we should require an increase in our national productive capacity of 75 per cent to meet their needs.

Now you who have a stake in the capital goods industries, recognizing there is little demand for your services unless we need additional facilities for production and services, must regard that as a mark to shoot at. Never mind the humanitarian aspect of it, never mind our obligations to our fellow men. Let's leave all that out of the equation. Let's look at it as practical business men trying to write a prescription for the future well-being of the capital goods industries. Obviously if we can do something that will require a continuous expansion of the productive facilities of the country, we shall be doing a service to those industries.

Here then is a field for study that should be of absorbing interest to producers in the capital goods industries. Of course, it makes all the difference in the world how you attempt that job. Certainly you cannot accomplish it by taking it away from the middle-class people and handing it to others, because then you are robbing Peter to pay Paul. Certainly

you cannot do it by methods and technics that will paralyze the very initiative and enterprise that are necessary if men are to go ahead and increase the productive capacity. Certainly we cannot do it by devices better calculated to win votes than to raise national income. We shall do it by getting back to what my friend said, and by recognizing that we have within our own system here the seeds of doing this job strictly in the American way, without the importation of any "isms" from any quarter of the globe.

It calls for a somewhat different orientation, for another look at the problem that we have been grappling with for 100 years with reasonable success. It calls for an understanding that the problem has been gradually changing its complexion a little.

Here is neither the time nor the occasion to undertake an exhaustive analysis of all the ills to which the body economic is heir. But if we should do that, we should find that a large share of them trace back to the violent swings and dislocations that periodically assail it. If we can find the sources of these and apply a corrective we shall be able to stabilize our progress more effectively; and if we do that we shall be in a fair way to correct at their source many of the evils at which we now are dabbing so superficially. And right now there is a feeling on the part of students that we should give some thought to the changing conditions that govern the investment of capital. And here I return to the point that I pegged a few minutes ago, a point that must be of much significance to men whose business depends on the investment process.

The point I made was our failure to recognize that capital goods are, in fact, consumed, used up, dissipated, just as truly as consumer goods—only at a somewhat slower rate. But that rate increases greatly with the progress of technology because of the increasing influence of obsolescence. That means that it is increasing more rapidily right now than it ever has done before.

Obviously as capital facilities are used up, whether by wear and tear in use, natural deterioration or obsolescence, we must write-off and retire the capital claims that are outstanding against them. When those facilities must be retired, because of being worn out or obsolete, we cannot hope to maintain the obligations issued against them any more than we can continue on the pay-roll a thousand men who must be laid off for lack of orders. Any effort to do either of these, results in costs and prices that militate against the wider distribution we are seeking.

We have had a notion in this land of ours that we can supply new capital facilities and finance them consistently through new capital obligations added to those already outstanding. And in a large measure we have been able to get away with it because of the constant expansion of the country in population and natural resources and the relatively slow progress of technology. But with a slowing up in the growth of population, the preemption of the natural resources and the amazing tempo of science and technology, it is very doubtful that we can continue to get away with it. At least not until we are a bit clearer as to the pattern of our future development than we are now.

So it is necessary that we get a new attitude toward capital financing and I believe that we are getting it. For again I would repeat that this is no brand-new doctrine. I am simply trying to interpret what I see going on today. Business men, industrialists and financiers recognize that the problems of unemployment relief, wage-and-hour regulation, social security and the rest are secondary to the really fundamental problem of sound financial practice, both public and corporate. When that is solved the others will click into place with a minimum of forcing.

One aspect of this new attitude is the recognition that we cannot continue to count on a constant natural increment to our capital values as we could while the country was growing up from infancy. We must become more "income-minded" and less "capital-minded." Did you ever hear an Englishman talk about an inheritance? He always says, "The pater left me a ten thousand a year." He never mentions the principal sum. But when an American talks about it, he says, "What do you think, the Old Man left me a million bucks."

What is he thinking about? He is thinking that that million bucks will grow into a couple of million in a few years. The expectation of an increment capital value is ingrained in the American character because we have come of several generations during which great fortunes have been built by the natural increment of capital rather than out of earnings alone. We are beginning to see that we cannot continue to do that on the same scale, that the great fortunes of the next generation will be, in the main, earned fortunes rather than won fortunes. They will be fortunes developed by industrialists. They will be fortunes that will result from the vision to see opportunity for service, the skill to coordinate technical science and human effort, the

energy and administrative genius to run useful businesses that will produce the things that people want and need and provide employment for all the people.

That is where the fortunes of the next few generations will come from, rather than from a natural capital increment based upon the exploitation of the natural growth and resources of a country. In my judgment, we have passed from a period of accumulation by accretion into one of accumulation by creation. Just as soon as we recognize that, many of these other superficial problems will be solved automatically, for men cannot create wealth without contributing to the well-being of the community of which they are a part.

I could develop this thought in detail, but my time is running short. We could note, for example, how we have progressed for 100 years by a series of bounds, with our financial structure two or three jumps ahead of our wealth structure. Then came the depressions when the financial structure collapsed. But the constant expansion and development of the country's wealth picked it up, caught it in its arms before it could be destroyed. Then it would start up again and fall again, only to have the rising development of our natural resources catch it up again. Then came a day in 1929 when for reasons we needn't go into here it didn't catch in time. It went down, down and down and now we are asking ourselves why. One reason why is that we cannot capitalize peak earnings, convert them into capital obligations and expect that process to go on and on and on. That is just another device for doing the thing that I described a few minutes ago—accumulation by accretion.

Another aspect of the new attitude toward capital financing is an increasing acceptance of amortization as an essential incident in the obsolescence of capital facilities. Nothing that I might say could put this better than it was put by the late Ogden D. Mills, Secretary of the Treasury in the Cabinet of Mr. Herbert Hoover,—and a banker of standing. Here is what Mr. Mills said shortly before his death a few years ago:

"We must face the fact that in a free economy there can be no security for capital, but that as on the one hand, capital must be accumulated for productive investment, simultaneously other capital must be dissipated through the march of progress."

That is that obsolescence factor that I was talking about.

Mr. Mills continues: "We must see to it that the benefits derived from increased efficiency and lower costs are directly and promptly passed on to consumers as the most effective way to insure a wide diffusion of prosperity and increased productivity."

Note that Mr. Mills here suggests that increased efficiency should not be used as a basis for increasing the capital obligations resting against the productivity of that plant. It should be disseminated widely through lower prices to the consumers, so that more people may buy more of the things that we want to produce. That means more employment and more opportunity for people to exchange their services and thereby avoid looking toward communism and fascism and the other "isms" for their solution.

I continue to read Mr. Mills, the banker: "We must keep alive the competitive process, which is a most vital element. If we yield to the temptation of resorting to such practices as price fixing and the suspension of competition through combination or agreement, then step by step we shall be led inevitably to government control.

"Since we cannot enjoy what we do not produce, the only way to raise the standard of living is to produce more and more. The only way to produce more is constantly to increase our productive efficiency. This is the function and effect of the competitive process. This is why monopoly cannot and will not do, for monopoly *emphasizes the security of invested capital,* whereas free enterprise recognizes that while it is necessary to accumulate capital, *it is equally necessary that capital be disseminated under the pressure of new inventions and new methods, obsolescence of markets, changing conditions and the march of progress.* Free enterprise seeks to stimulate expansion and progress. Monopoly to keep things as they are. The one holds out the shining hope that abundance will conquer poverty; the other can but insure its perpetuation."

This is in Mr. Mills' phrase although the italics are mine. We shall find it necessary to recognize what he calls the "dissipation of capital." Whereas the growth of the country and the development of its natural resources may have provided a cushion for this constant expansion of capital claims against our economy in the past, we cannot expect it to continue. It is necessary that much of the gains made by our economy be plowed back just as quickly and as widely as possible so that we may do two things: constantly replace our obsolete productive and service facilities, and constantly provide a higher standard of living for more and more of the people, so

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Crushed and Broken Stone in 1938

By OLIVER BOWLES
and M. SCHAUBLE

Nonmetal Economics Division
U. S. Bureau of Mines

THE total output of crushed and broken stone in the United States in 1938, as reported to the Bureau of Mines by producers, amounted to 123,072,820 short tons valued at $117,476,884, a decrease of 6 per cent in quantity and 4 per cent in value compared with 1937. Included in this total is stone sold or used for concrete aggregates, railroad ballast, riprap, agricultural limestone, refractory stone, and stone for metallurgical use (flux), alkali works, calcium carbide works, sugar and glass factories, paper mills, and various other chemical and manufacturing processes. Stone used in the manufacture of lime or cement, asphaltic stone, or slate used for granules or flour is not included in this total.

Crushed or broken stone used for concrete aggregates and railroad ballast constituted 77 per cent of the industry in 1938—94,763,050 short tons valued at $88,767,221. Nearly 40 per cent of the concrete and road making aggregates was produced by noncommercial operators (States, counties, municipalities, and other government agencies). Noncommercial production in 1938 increased 32 per cent compared with 1937, whereas commercial output declined 3 per cent.

In 1938 about 60 per cent of the commercial aggregates was transported by truck; 22 per cent by railroad; 10 per cent by water; and the remainder unspecified. Comparable figures for 1937 are as follows: Truck, 61 per cent; railroad, 26 per cent; water, 9 per cent.

Crushed stone for metallurgical purposes, which ranks next to concrete aggregates in quantity consumed, fell to an unusually low level in 1938, registering a decline of 55 per cent compared with 1937. Limestone for agricultural use (4,367,410 short tons valued at $5,637,485) declined 13 per cent in both quantity and value. Of the total, 423,640 short tons valued at $579,331 was noncommercial production by

CRUSHED AND BROKEN STONE SOLD OR USED BY PRODUCERS IN THE UNITED STATES, 1937-38, BY PRINCIPAL USES.

Use	1937			1938		
	Short tons	Value		Short tons	Value	
		Total	Average		Total	Average
Concrete and road metal	80,271,900	$76,972,465	$0.96	88,787,080	$84,212,446	$0.95
Railroad ballast	8,160,670	5,852,143	.72	5,975,970	4,554,775	.76
Metallurgical	21,331,970	14,704,458	.69	9,702,860	6,943,429	.72
Alkali works	4,860,520	2,295,599	.47	3,634,050	1,743,173	.48
Riprap	5,388,920	5,850,101	1.09	6,210,520	6,995,418	1.13
Agricultural	5,004,930	6,454,695	1.29	4,367,410	5,637,485	1.29
Refractory (ganister, mica schist, dolomite, soapstone)	1,525,260	2,258,900	1.48	659,690	991,765	1.50
Asphalt filler	351,590	686,951	1.95	288,590	789,587	2.74
Calcium carbide works	472,240	266,557	.56	246,010	137,522	.56
Sugar factories	566,620	862,660	1.52	619,910	878,028	1.42
Glass factories	274,770	460,352	1.68	170,560	290,297	1.70
Paper mills	322,810	589,091	1.82	223,450	373,207	1.67
Other uses	2,729,810	4,626,619	1.69	2,186,720	3,929,752	1.76
	131,262,010	121,880,591	.93	123,072,820	117,476,884	.95
Portland cement (including cement rock)[1]	29,547,000	(2)	----	26,183,000	(2)	----
Natural cement (cement rock)[1]						
Lime[3]	8,250,000	(2)	----	6,694,000	(2)	----
Total stone	169,059,000			155,950,000		
Asphaltic stone	447,213	2,035,410	4.55	483,497	2,409,616	4.98
Slate granules and flour	277,010	1,578,014	5.70	349,000	2,489,962	7.13

[1] Value reported as cement in the chapter on cement.
[2] No value available for stone used in manufacture of cement and lime.
[3] Value reported as lime in chapter on Lime.

the Soil Conservation Service, W. P. A., State, County, and other governmental agencies. Refractory stone (ganister, mica schist, dolomite, and soapstone) amounting to 659,690 short tons valued at $991,765, dropped to less than half of the 1937 production (1,525,260 short tons valued at $4,258,900).

Limestone used for miscellaneous purposes declined from 8,636,070 short tons valued at $8,424,338 in 1937 to 6,780,400 short tons valued at $7,073,004 in 1938, or a decrease of 21 per cent in quantity and 16 per cent in value. Despite this decline in total quantity sold, limestone used for fertilizer filler, filter beds, poultry grit, and sugar factories increased considerably over 1937. The use for limestone sand has developed sufficiently in the past year to warrant its being published as a separate item in one of the accompanying tables which shows limestone sales by uses in 1938.

The accompanying tables present the salient statistics of the crushed and broken stone industries in 1938.

CRUSHED STONE SOLD OR USED BY COMMERCIAL AND NONCOMMERCIAL[1] OPERATORS IN THE UNITED STATES, 1934-38.[2]

Year	Commercial Operations			Noncommercial operations			Total
	Short tons	Average value per ton	Per cent of total quantity	Short tons	Average value per ton	Per cent of total quantity	Short tons
1934	43,259,180	$.94	71.4	17,308,740	$.91	28.6	60,567,920
1935	38,090,660	.90	69.6	16,663,860	.87	30.4	54,754,520
1936	57,494,430	.93	65.9	29,776,390	.95	34.1	87,270,820
1937	62,315,350	.88	70.5	26,117,220	1.06	29.5	88,432,570
1938	60,254,170	.88	63.6	34,508,880	1.04	36.4	94,763,050

CRUSHED OR GROUND LIMESTONE SOLD OR USED BY PRODUCERS IN THE UNITED STATES FOR MISCELLANEOUS USES, 1938.

Use	1938 Short tons	1938 Value
Alkali works	3,634,050	$1,743,173
Calcium carbide works	246,010	137,522
Coal-mine dusting	50,890	178,263
Filler (not whiting substitute):		
Asphalt	288,590	789,587
Fertilizer	121,130	202,189
Other	61,970	245,356
Filter beds	142,050	127,586
Glass factories	170,560	290,297
Limestone sand	229,890	180,863
Magnesia works (dolomite)	62,540	99,684
Mineral food	65,570	226,844
Mineral (rock) wool	86,400	85,378
Paper mills	223,450	373,207
Poultry grit	31,260	153,789
Refractory	263,930	274,624
Road base	205,840	117,882
Stucco, terrazzo, and artificial stone	23,360	146,828
Sugar factories	619,910	878,028
Whiting substitute[1]	145,170	671,842
Other[2]	80,350	89,447
Unspecified	27,480	60,615
	6,780,400	7,073,004

[1] Includes stone for filler for graphite, kalsomine, linoleum, paint, pigments, pottery, putty, regrinding, rubber, sealing wax, soap, tile, and uses not specified.

[2] Includes stone for acetic acid, acid neutralization, bird gravel, carbon dioxide, cement blocks, chemicals (unspecified), concrete blocks and pipes, dye works, explosives, fill, fireplace stone, foundry facings, lime burning, roofing gravel, sand, spalls, and waste rock.

[1] By States, Counties, Municipalities, and other Government agencies, directly or under lease.

[2] Includes stone for concrete and road metal and railroad ballast.

Present Trends and the Capital Goods Industries

(*Continued from page 16*)

that they may be in position to buy and consume more and more of the production of industry.

This, it seems to me, is the trend through which we are living. I don't believe that it is widely enough recognized. I believe it is being interpreted unduly as an evil trend. It is natural that those of us who have put our stake into the capital facilities of this country are a bit concerned that we may see the things that we have come to consider permanent depreciated and wiped out. That is natural. But I believe that unless we do see this reality for what it actually means, unless we do recognize the need for a revised attitude toward the responsibilities and obligations of capital administration, we may hasten the day when we shall carry on our backs one or another of the "isms" that torment the rest of the world today.

I believe we have something better than they have to offer many times over. I believe that with it we have achieved standards of living for the ordinary man that cannot possibly be realized under any substitute now known to men. I believe that we must be smart enough and broad visioned enough to adapt what we have to the times through which we are living. And if we do that I see no reason why we should not climb to even greater achievement, and confound those critics who today are hawking the substitutes.

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